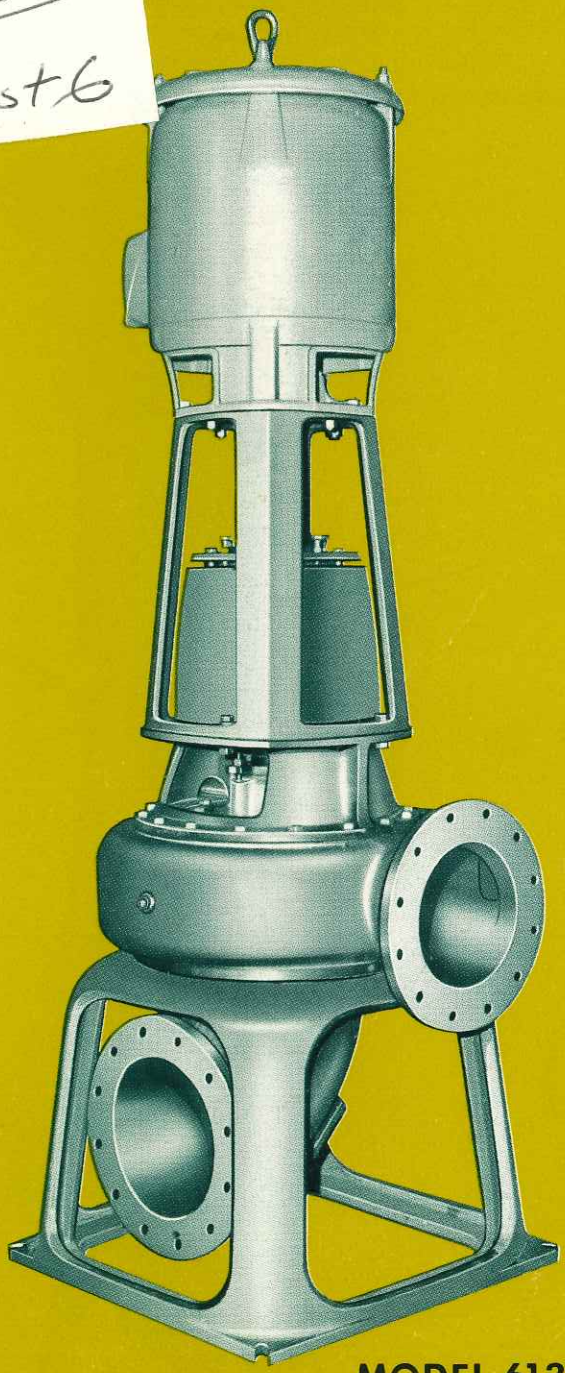
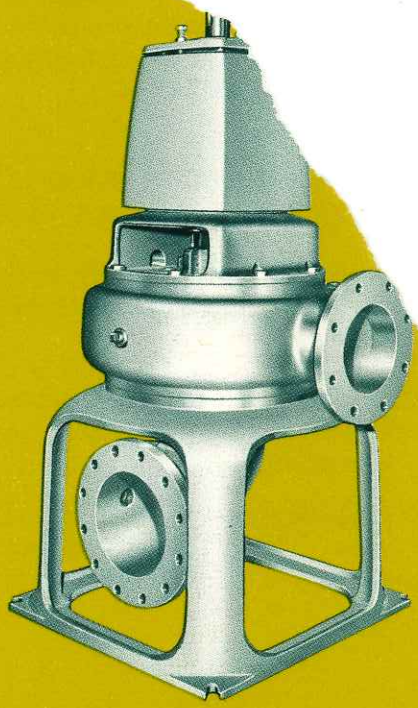
103
Publications
103
415/902

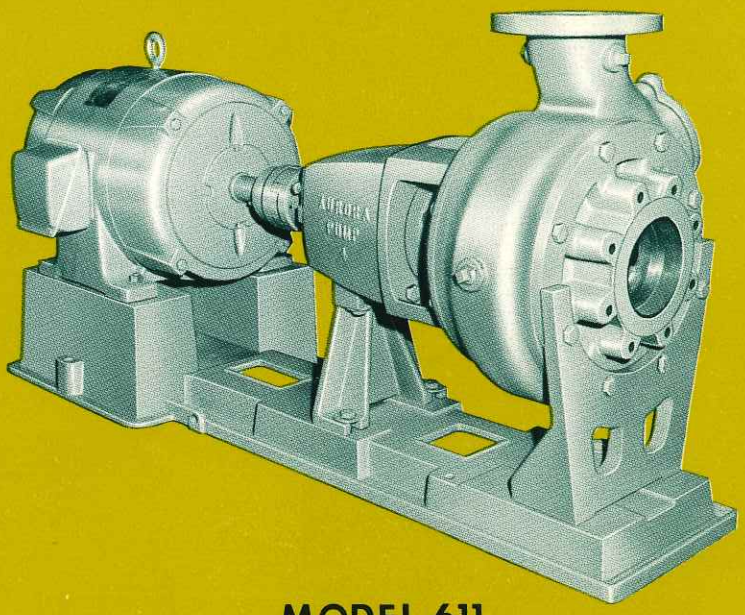
AURORA® PUMP

415
Digest+6

A.I.A. FILE NO.







MODEL 613

MODEL 611

© 1968 AURORA PUMP
AURORA, ILLINOIS

with a broader understanding of the water pollution
he need for more and better sewage treatment facilities.
and tomorrow demand more economical and reliable sew-
. Longer life has become essential to overall pump performance.
ecognizes this need, and with this bulletin offers the new ***SPHER-FLO***
y duty horizontal and vertical non-clog pumps as our solution to your
problems.

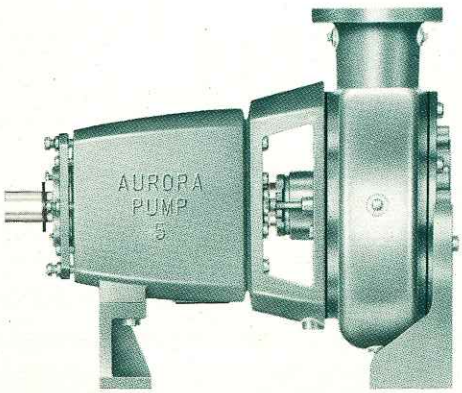
**610 SERIES PUMPS ARE
E IN THREE MODELS:**

611 are horizontally baseplate
d with a driver flexibly coupled
pump.

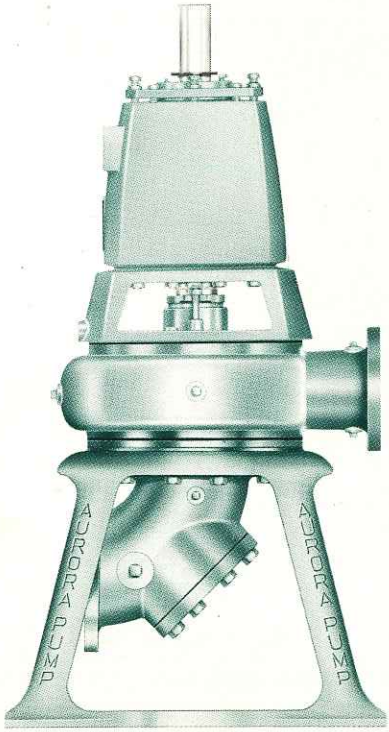
DELS 612 are vertically mounted and
ilize flexible shafting between the driv-
er and the pump.

MODELS 613 are vertically mounted with an elevated driver coupled directly to the pump thru a flexible coupling.

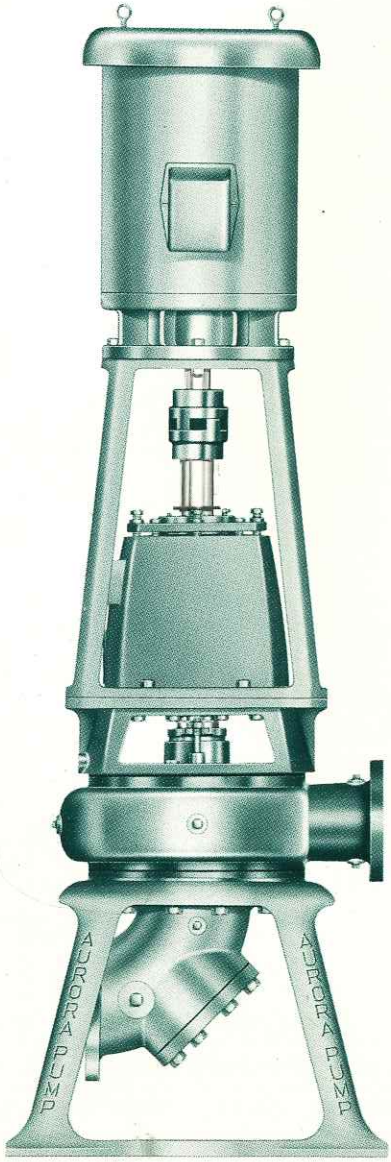
MODEL 611



MODEL 612



MODEL 613



STANDARD

- 3" to 6" sphere handling capability
- All iron fitted pump construction
- Regreaseable bearings*
- Double row thrust bearing*
- Hardened stainless steel (450 min. Brinell) shaft sleeve
- Interchangeable packing and mechanical seal inserts
- External impeller clearance adjustment
- Taper shaft fit at impeller
- Stainless steel impeller key
- Carbon steel shaft
- Front or back impeller pull out
- Enclosed impeller with wiper blades
- Dynamically balanced impeller
- Centerline discharge casing
- Hydrostatic test all pumps

*For an average bearing life of ten years. See page 6 for further details.

OPTIONAL

- Removable split packing box
- Stainless steel case wear ring
- Stainless steel impeller wear ring
- Suction nozzle with clean out (Model 611-only)
- Double mechanical seal
- Stainless steel shaft
- Wear ring face flush line
- External stuffing box piping with filter or valve
- Automatic stuffing box grease seal
- Spacer type coupling (Model 611-only)
- Coupling guard
- Flexible shaft drive with or without guard (Model 612-only)
- Water Seal Unit (See Bulletin 690)
- Constant liquid level system (Apco-Trol Variable Speed – See Bulletin 720)
- Certified test report – witnessed or unwitnessed
- Special alloy pump construction

QUICK REFERENCE TYPE

SPHER-FLO

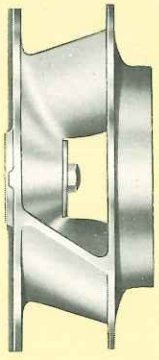
NON CLOG FEATURE SELECTOR

AURORA *SPHER-FLO* pumps are available for capacities to 9,500 gallons per minute and heads to 250 feet. The smallest pumps will pass a 3 inch diameter sphere and the largest passes a 6 inch diameter sphere.

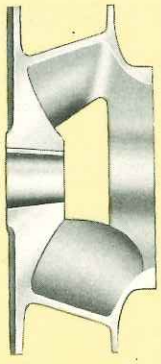
EFFICIENT SKEWED VANE IMPELLER provides smooth flow and maximum ability to avoid clogging. The ***SPHER-FLO*** impeller is an exclusive Aurora design.

CENTERLINE DISCHARGE CASINGS are self venting and eliminate the need for left hand pumps. Oversize cleanout openings near the casing cutwater simplify cleaning. The minimum cleanout size is 3" x 5". The casing discharge can be mounted on 45° increments.

BEARINGS are selected for 2 year minimum life at worst conditions of load. Average bearing life is 10 years. See page 6 for further details.



TAPERED IMPELLER FIT assures tight impeller to shaft and facilitates impeller removal. Back wiper vanes balance thrust bearing loads and prevent clogging behind impeller.



AURORA® PUMPS

FEATURES

RUGGED CONSTRUCTION INSIDE AND OUT PROTECTS YOUR INVESTMENT

LIFTING EYE tap simplifies pump disassembly.

WATER SLINGERS and grease seals protect both bearings from moisture.

RUGGED SHAFT with taper for easy impeller removal.

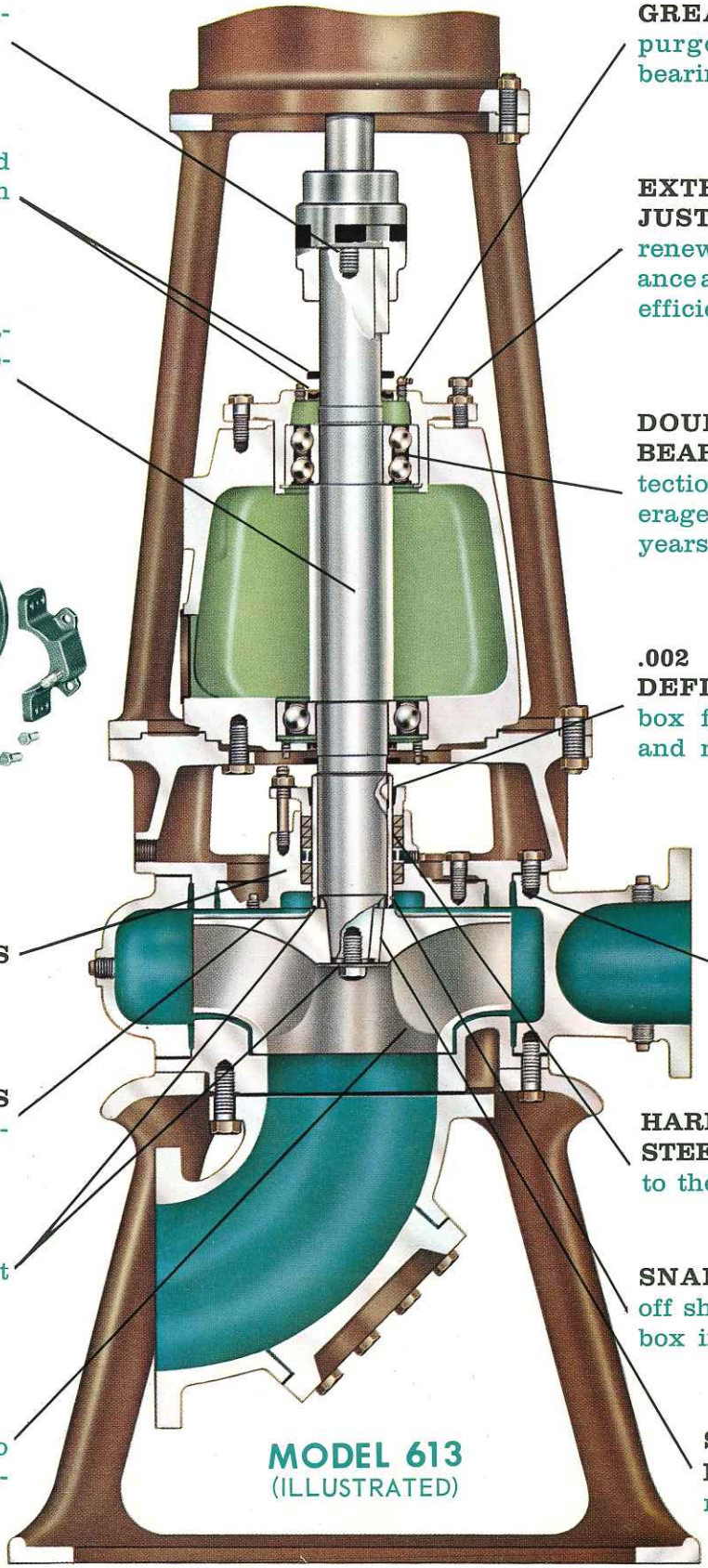
OPTIONAL SPLIT PACKING INSERT

INTERCHANGEABLE SPLIT PACKING INSERTS or seal inserts.

IMPELLER WIPER VANES minimize stuffing box pressure.

GASKETS protect shaft from pumped liquid.

IMPELLER VANES brought well into the eye to pick up liquid early—minimize clogging.



MODEL 613
(ILLUSTRATED)

GREASE LUBRICATION purges old grease from bearings.

EXTERNAL SHAFT ADJUSTMENT provides for renewing impeller clearance and maintaining pump efficiency.

DOUBLE ROW THRUST BEARINGS are added protection for high loads. Average bearing life is 10 years. (See page 6)

.002 MAXIMUM SHAFT DEFLECTION at stuffing box face extends packing and mechanical seal life.

BACK PULLOUT DESIGN for pump maintenance, does not disturb piping. (See page 15)

HARDENED STAINLESS STEEL SLEEVES are keyed to the shaft.

SNAP RING pulls sleeve off shaft when the packing box insert is removed.

STAINLESS STEEL IMPELLER KEY, lock nut and washer.

MODERN STYLING IMPROVES THE INSTALLATION APPEARANCE

EXTERNAL FEATURES

NEMA STANDARD "P" face motors

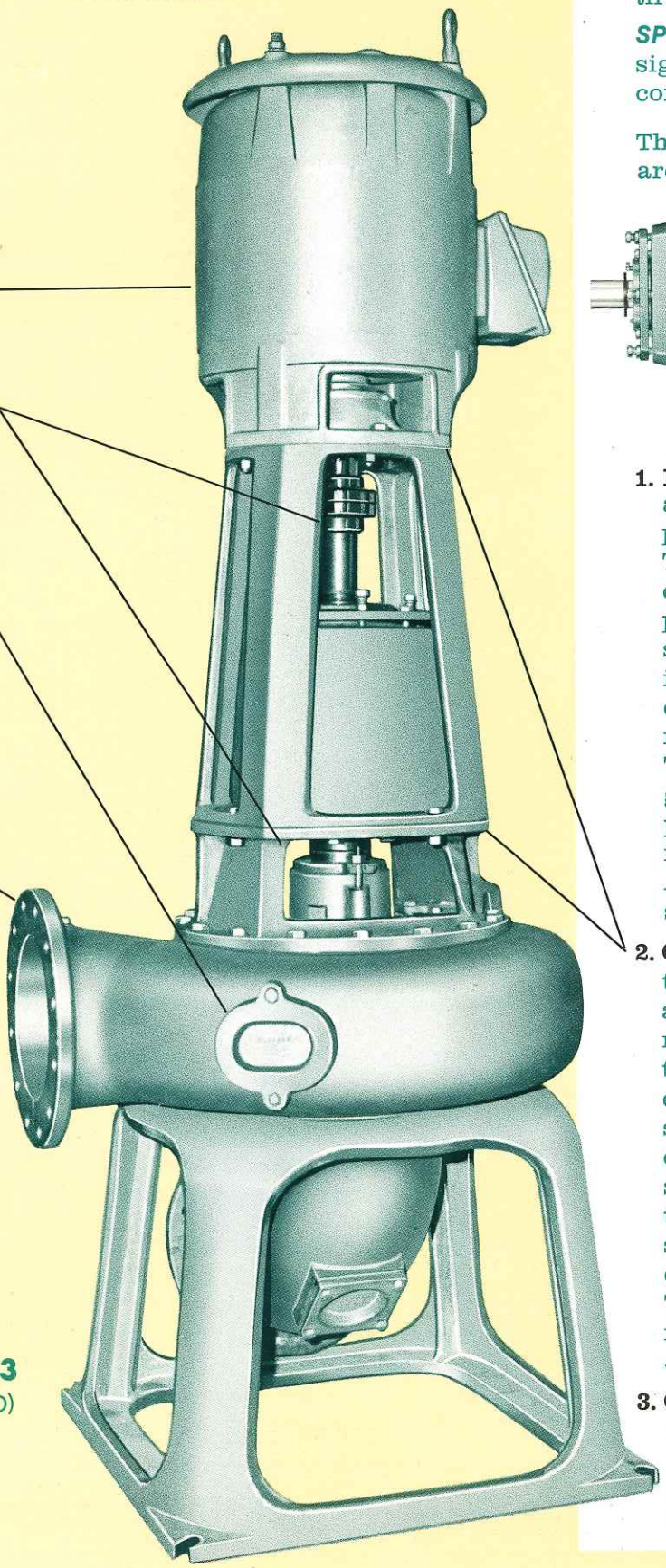
LARGE ACCESS OPENINGS provide adequate visibility and working room.

OVAL CLEANOUTS are HAND SIZE and located to provide visibility and accessibility to the impeller and the casing cutwater.

DISCHARGE and suction flanges can be located in 45° increments for 8 different positions.

½" NPT GAUGE TAPS are conveniently located at the discharge and suction openings.

¾" NPT DRAIN TAPS are conveniently located.



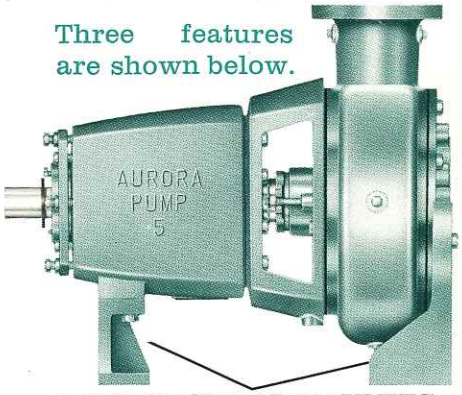
MODEL 613
(ILLUSTRATED)

MOUNTING DETAILS

SUPPORT of various pump components is important. Inadequate mounting designs impose unnecessary stress and strain on the entire pump and installation.

SPHER-FLO pumps are designed to provide the best component support.

Three features are shown below.



1. **HORIZONTAL 611 UNITS** are supported at both pump and coupling end. This, with centerline discharge support, provides protection against pipe strain and maintains casing support when the drive end of the pump is removed for servicing. The rear support foot greatly simplifies coupling alignment and is an important feature of the Aurora ***SPHER-FLO*** design.

2. **On VERTICAL 613 UNITS,** the cast motor base has a registered fit at the motor end and is fastened to a separate pump adapter. This arrangement assures alignment and concentrates loads on the separate pump adapter thereby eliminating strain and misalignment of the bearing housing. This is another exclusive feature of the Aurora ***SPHER-FLO*** pump.

3. **On 612 and 613 UNITS** the cast suction base is registered to the suction cover assuring adequate support for the complete unit.

BEARING LIFE

Tables 1, 2, and 3 will enable you to determine the minimum thrust and radial bearing life for any pump size. The minimum life shown is for the worst conditions of load or pump shutoff. Bearing life at any other point on the curve and at reduced impeller diameters will greatly exceed the minimum life shown. Average bearing life is equal to five times the minimum bearing life.

1. Determine the proper pump size and speed from the range charts illustrated on pages 8 and 9 of this bulletin.
2. Read K value by pump size and speed from Table 1. This value will be used for determining **both** outboard thrust and inboard radial bearing life in years.
3. Locate K on Table 2 and read across to the proper speed in RPM and then down for outboard thrust bearing life. If the K value from Table 1 is brown bold face, use the brown line. If the K value from Table 1 is light face, use the black line.
4. Locate K on Table 3 and read across to the proper speed in RPM and then down for inboard radial bearing life. If the K value from Table 1 is brown bold face, use brown line. If the K value from Table 1 is light face, use the black line.

EXAMPLE:

1. A 6 x 6 x 12 pump at 1750 RPM (**15.9** K value) would have
   A. Continuous outboard bearing life of 4.48 years
   B. Continuous inboard bearing life of 10.6 years
2. A 6 x 6 x 12 pump at 1150 RPM (**19.1** K value) would have an
   A. Continuous outboard bearing life of 13 years
   B. Continuous inboard bearing life of 11.3 years

NOTE:

1. K values given are for worst condition of load or pump shutoff. (Max. impeller dia.)
2. One (1) year life is based on 8740 hours (continuous operation).
3. Additional bearing information can be found on page 7.
4. Detailed information on bearing life and shaft deflection can be obtained from the factory.

LIMITATIONS

Maximum hydrostatic test pressure.....150 PSI
Maximum recommended case working pressure .....125 PSI
Maximum suction pressure.....125 PSI
Maximum Temperature °F .... Packing 250°F, Mech. Seal 225°F
Maximum operating speed.....1750 RPM

SUBMERGENCE

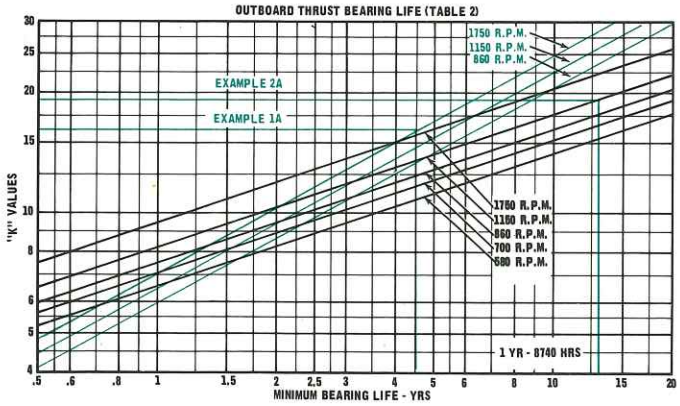
Air may be entrained in the pumped liquid if the pump suction is located too close to the free liquid surface in the suction source.

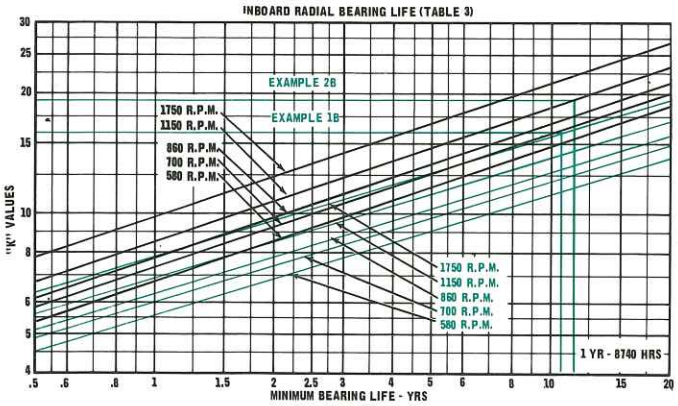
Pumping liquid with entrained air can cause a reduction of capacity, rough and noisy operation, vibration, loss of efficiency and wasted power. Excessive wear of close running parts, bearing stresses and shaft damage are also subsequent effects.

TABLE 1 — VALUES OF "K"

SIZE	4x5x7	4x5x10	4x5x12		4x5x15	6x6x12	6x8x15	6x8x18	8x8x15	8x10x18	8x10x22		10x12x22		12x14x22	
POWER SERIES	4	4	5	4	5	5	5	5	5	6	5	6	5	6	5	6	5
1750 RPM	26.2	15.2	16.6	–	**11.1**	**15.9**	**8.8**	–	–	–	–	–	–	–	–	–	–
1150 RPM	41	24.1	–	11.9	13.5	19.1	10.7	**9.8**	**10.9**	**9.2**	–	–	–	–	–	–	–
860 RPM	–	43.2	–	21.5	24.7	35.5	19.4	13.1	14.5	–	11.5	**9.8**	–	**8.3**	–	**8.3**	–
700 RPM	–	–	–	33	37.1	52.5	29.2	20	22.1	–	17.5	–	11	9.6	–	9.6	–
580 RPM	–	–	–	–	55.5	–	42.9	29.5	33	–	26	–	16.4	–	14.2	–	14.2
SPHERE SIZES	3	3	3	3	3	3	4	4	5	5	5	5	5	6	6	6	6

BOLD BROWN VALUES ARE FOR ROLLER BEARING CONSTRUCTION





If the capacity in gallons per minute and the suction inlet size or area is known the minimum height of the liquid above the suction inlet (submergence) can be determined.

A properly designed suction inlet and sump can be accomplished with the help of the submergence chart illustrated.

Typical submergence requirements are shown on the chart.

EXAMPLES:

(1) When the pipe size is known, the minimum submergence required for 2000 GPM through an 8″ pipe is 9.6 feet.

(2) When the inlet area is known, the minimum submergence required for 2000 GPM through a 50 square inch outlet is 9.6 feet.

Minimum submergence requirements may exceed the available space requirements. When this occurs a larger pipe size or inlet will reduce the required submergence.

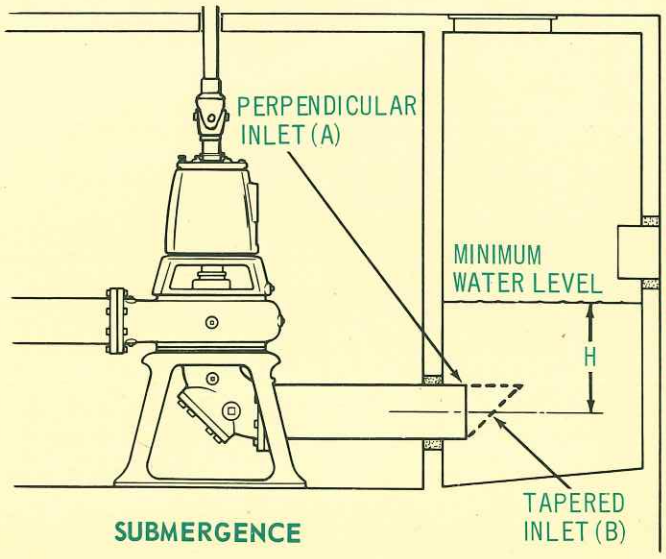
EXAMPLE:

(3) The minimum submergence required for 2000 GPM through a 10″ pipe is 4.6 feet (5.0 feet less than required for an 8″ pipe).

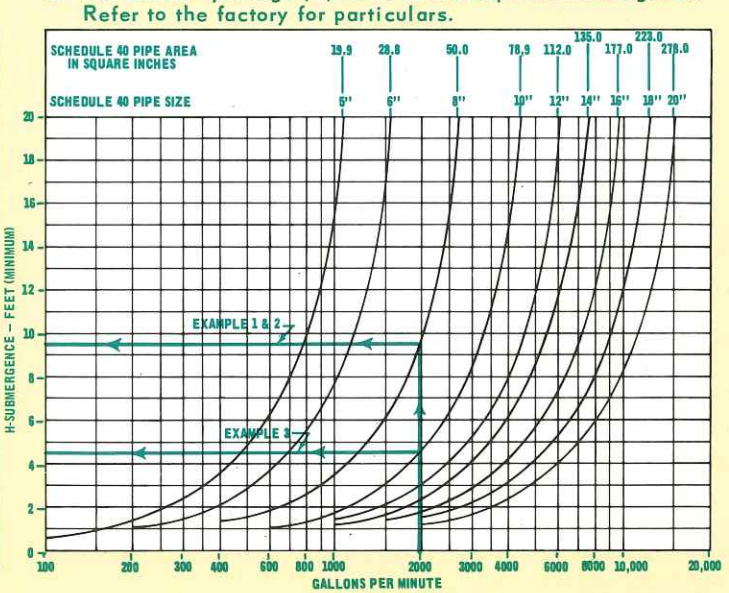
LISTED BELOW ARE DETAILS AND DIMENSIONS OF THE SPHER-FLO MODELS OF AURORA PUMPS IN POWER SERIES 4, 5 AND 6.

AREA		DIMENSION	4	5		6
			4A **4B**	5A **5B**	5C **5D**	6A **6B**
STUFFING BOX	Packing	Stuffing Box Bore Diameter	3-9/32	4-25/32	4-25/32	6-25/32
		Stuffing Box Depth	2-3/4	3-1/2	3-1/2	5-1/8
		Outside Dia., Sleeve for Packing	2-1/2	3-3/4	3-3/4	5-1/4
		Total Number of Packing Rings With Lantern Ring	5	5	5	5
		No. of Rings in Front of L. Ring	2	2	2	2
		Packing Size	3/8 x 3/8	1/2 x 1/2	1/2 x 1/2	3/4 x 3/4
		Width of Lantern Ring	5/8	3/4	3/4	1-1/8
		Distance from Box to Nearest Obstruction	2-1/4	2-3/16	2-3/16	3
	M. Seal	Dia. of Mech. Seal Seat (Bore)	3-3/8	4-5/8	4-5/8	Refer to Factory
		Length of Mechanical Seal	3-1/4	4-7/16	4-7/16	Refer to Factory
		Outside Dia., Sleeve for M. Seal	2-1/2	3-3/4	3-3/4	Refer to Factory
SHAFT		Dia. at Impeller (Average of Taper)	1-7/16	2-1/4	2-7/8	2-7/8
		Diameter at Shaft Sleeve	1-7/8	3-1/4	3-1/4	4-1/2
		Diameter Between Bearings (Max. Shaft Dia.)	3-5/16	4-1/8	4-1/8	5-1/4
		Diameter at Coupling End	1-1/4	2-3/8	2-3/8	2-7/8
		Max. Deflection at Stuffing Box Face	.002"	.002"	.002"	.002"
BEARINGS		Bearing No. (Inboard Radial)	311 **NJ311**	317 **NJ317**	317 **NJ317**	224 **120RJ02**
		Bearing No. (Outboard Thrust)	5309F	5315F	5315F	**22222C 110SD22**
		Bearing Centers	7-11/16	12-17/32	12-17/32	12-25/32
		Minimum Life of Bearing Under Worst Conditions of Load (2)	2 Years	2 Years	2 Years	2 Years

NOTE:
(1) Power Series can be Determined from Range Charts on Page 8 and 9.
(2) Average Bearing Life is 5 Times Minimum Life.
(3) **4B – 5B – 5D** and **6B** Inboard Radial Bearings are Cylindrical Roller. **6A** and **6B** Outboard Thrust Bearings are Spherical Roller. All Other Bearings are Ball.
(4) Power Series **4B** Not Furnished as a Standard Construction.



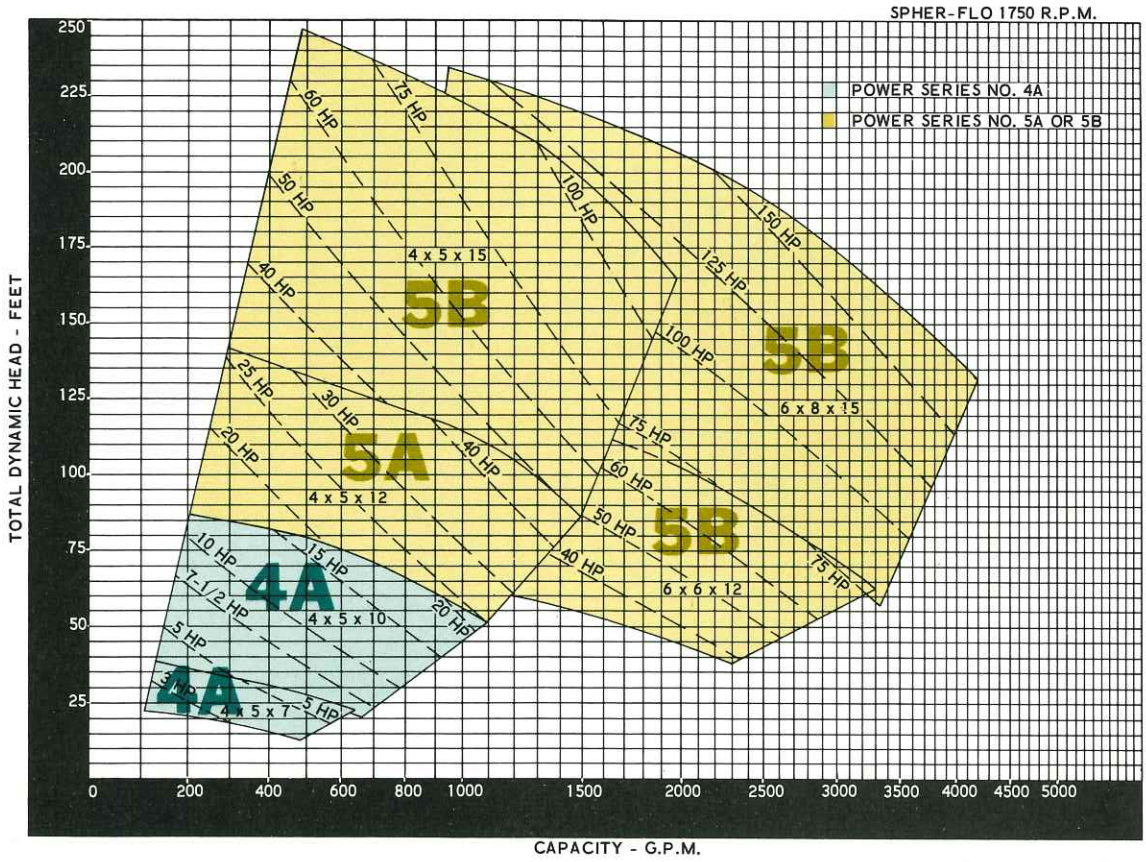
1. The table illustrated is for INLET (A).
2. TAPERED openings (B) will reduce required submergence. Refer to the factory for particulars.



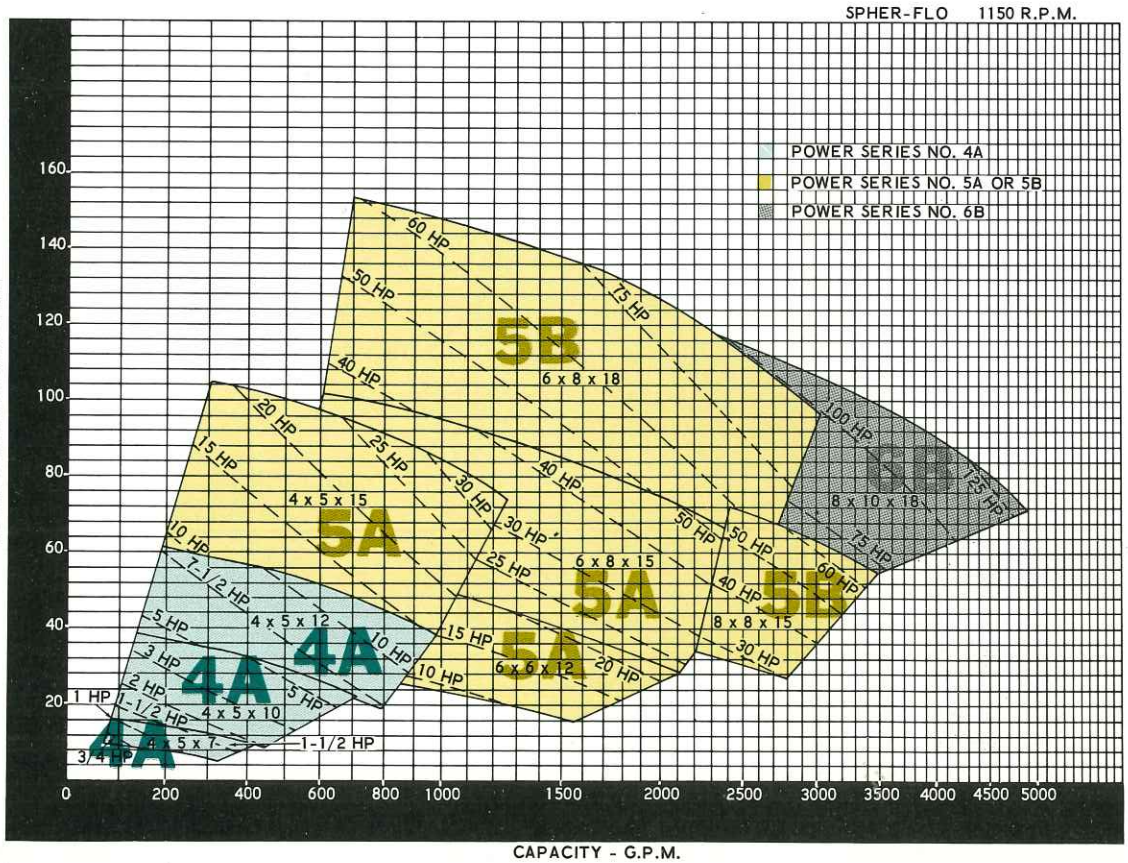
RANGE CHARTS

The range charts below illustrate the wide range of coverage of the 611, 612, and 613 models of ***SPHER-FLO*** pumps at various speeds.

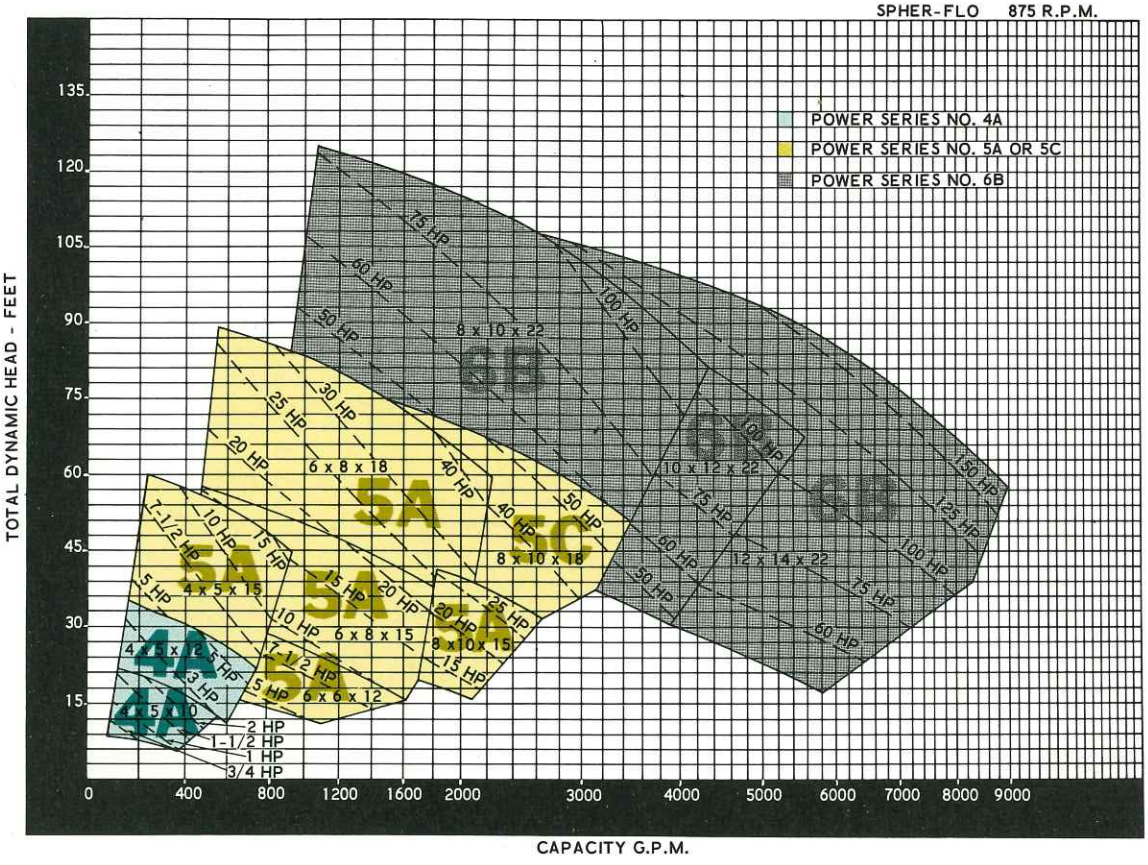
1750 R.P.M.



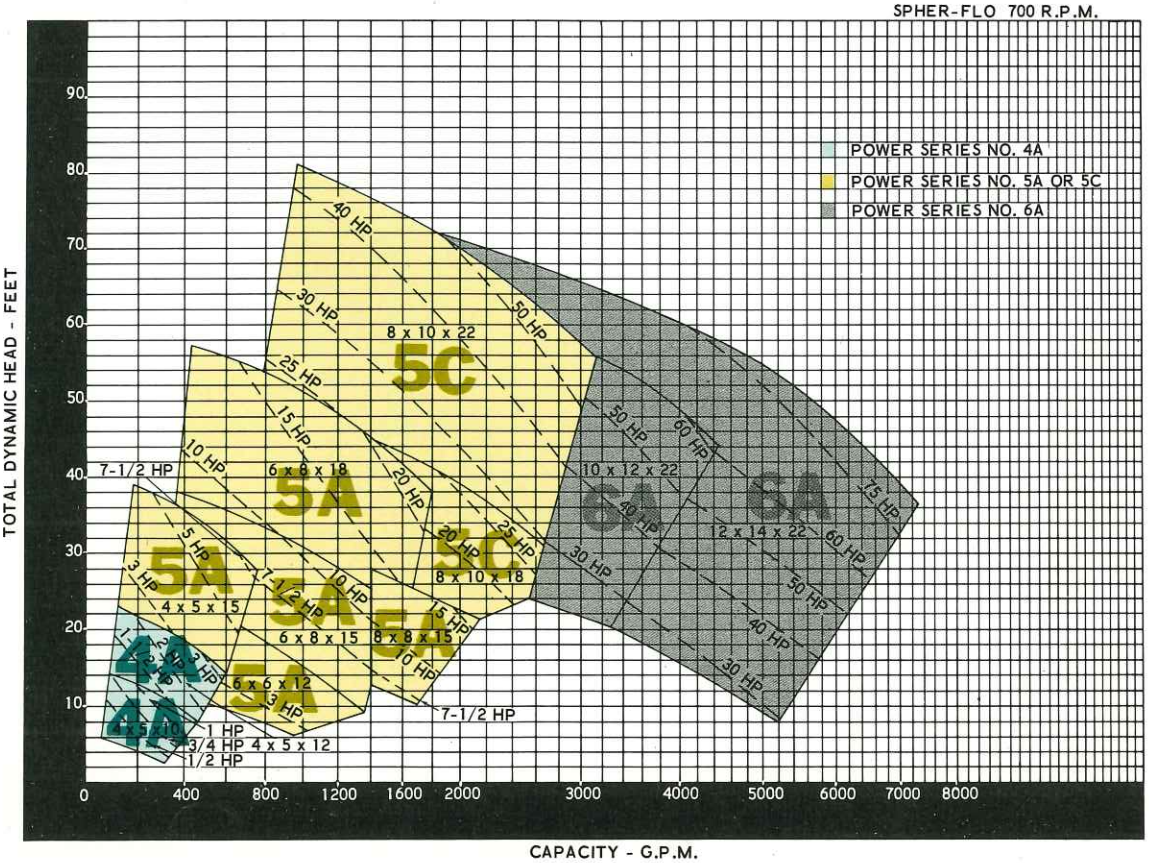
1150 R.P.M.



Individual performance curves must be used for final selection.
For selections not shown on range charts, refer to the factory.



875 R.P.M.



700 R.P.M.

INTERCHANGEABILITY

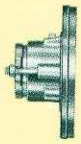
SPHER-FLO pumps are designed for maximum interchangeability. Each model is available in 12 different sizes, offering a model and size precisely fitted to the installation requirements over a wide range of capacities. The 12 sizes are divided into 3 "power series." Within a given power series, all parts are interchangeable except for the liquid end parts and pump supports.

The charts below illustrate the degree of interchangeability achieved with the standard ***SPHER-FLO*** pumps.

	PUMP SIZE	4 x 5 x 7	4 x 5 x 10	4 x 5 x 12	4 x 5 x 15	6 x 6 x 12	6 x 8 x 15	6 x 8 x 18	8 x 8 x 15	8 x 10 x 18	8 x 10 x 22	10 x 12 x 22	12 x 14 x 22
	POWER SERIES												
RPM	1750	4A	4A	5A	5B	5B	5B						
	1150	4A	4A	4A	5A	5A	5A	5B	5B	6B			
	875		4A	4A	5A	5A	5A	5A	5A	5C	6B	6B	6B
	700		4A	4A	5A	5A	5A	5A	5A	5C	5C	6A	6A
	580						5A	5A	5A	5C	5C	5C	5C

A

3 POWER FRAMES
(8 POWER SERIES)



B

4 INSERTS

C

9 BRACKETS

D

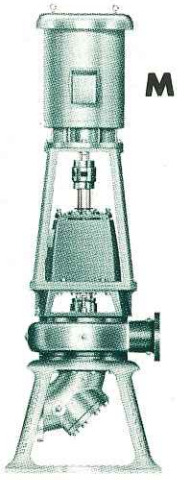
12 IMPELLERS

E

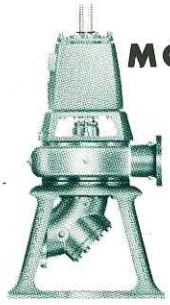
12 CASINGS

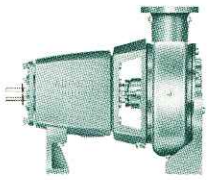
SPHER-FLO PUMPS

MODEL 613



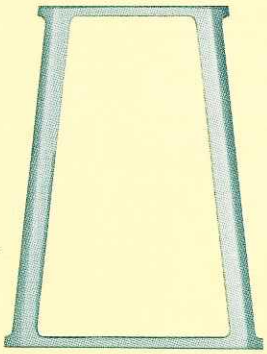
MODEL 612





MODEL 611

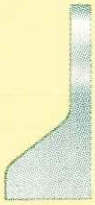
A – Power Frames
B – Inserts
C – Brackets
D – Impellers
E – Casings
F – Mtg. Feet (Rear)
G – Mtg. Feet (Front)
H – Elbows
J – Bases
K – Supports



K

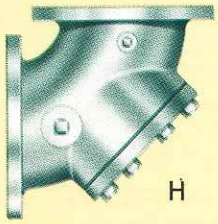
2 MOTOR SUPPORTS

F



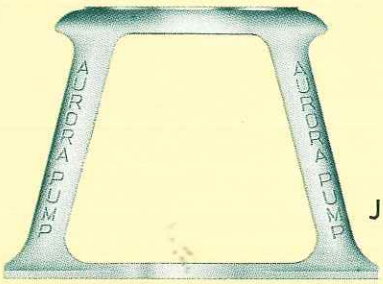
G

MOUNTING FEET



H

5 SUCTION ELBOWS



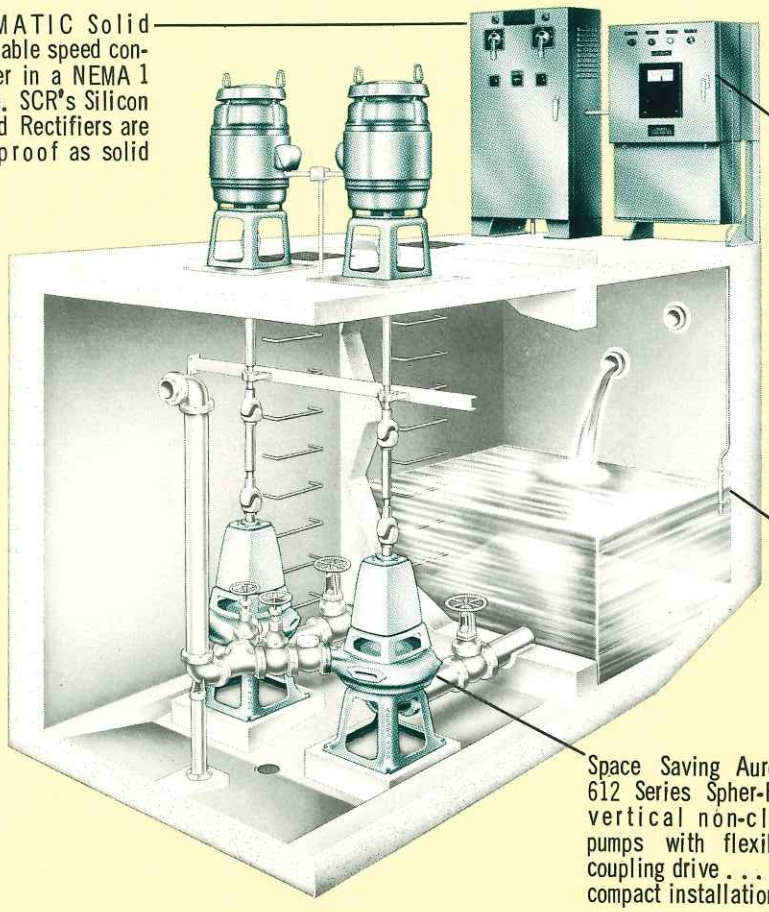
J

4 SUCTION BASES

MAINTAINS CONSTANT LIQUID LEVEL AUTOMATICALLY REGARDLESS OF INFLUENT RATE

The APCO-TROL liquid level system senses changes in liquid level and varies pump discharge rate to match influent rate. Maximum liquid level variation will not exceed ±4". Use of solid state electronics makes speed changes smoothly and instantaneous. Pump speeds are increased automatically when the liquid level rises and decreased when the level falls. The tried and proven bubbler system is used to measure liquid level.

The unique APCO-TROL System combines the reliability of the bubbler system with the proven solid state APCO-MATIC variable speed control center. The entire system is available to you from a single source. Just install, provide power and you're in business. Smooth, continuous variation of pump speed controls liquid level without pump stops and starts. This eliminates high inrush current, pump wear and tear, and produces greater power savings. Floats, float cages and electrical probes are eliminated, greatly reducing maintenance and associated costs.



APCO-MATIC Solid State variable speed control center in a NEMA 1 enclosure. SCR's Silicon Controlled Rectifiers are as foolproof as solid wire.

APCO-TROL Control Center in a NEMA 1 enclosure. Indicating transducers sense pressure changes in the bubbler tube and activate the APCO-MATIC control center.

Gold Band Bubbler Tube indicates where constant level will be maintained.

Space Saving Aurora 612 Series Spher-Flo vertical non-clog pumps with flexible coupling drive . . . for compact installations.

CONSTANT LIQUID LEVEL APCO-TROL VARIABLE SPEED SYSTEMS

The APCO-TROL LIQUID LEVEL SYSTEM is the simplest, most easily installed, and reliable of all the systems available. The system requires no slip rings, motor brushes or complicated controls. No special clutches, extra couplings or additional machinery is required. The SCR Control Panel varies the voltage to the NEMA D drive motor to control the speed of the pump depending on liquid level. The increased wear, shock, and inrush current common to on-off systems is eliminated with the variable speed system. Smooth, continuous variation of pump speed to exactly accommodate the liquid load provides the utmost dependability and reliability.

For complete details, see Bulletins 710 and 720.

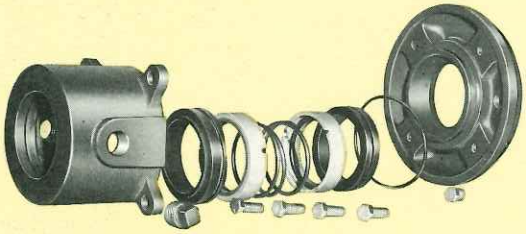
AURORA® PUMPS

OPTIONAL

STANDARD *"SPHER-FLO"* PUMPS are designed for the requirements of the majority of applications. However, to meet special requirements, a number of optional features are available. For requirements not handled by the illustrated features, refer to the factory.

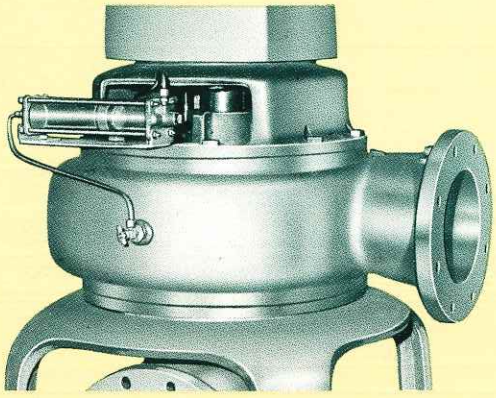
SPLIT PACKING BOX

SPLIT PACKING BOXES separate vertically through the packing insert to simplify packing replacement and shaft sleeve inspection. The insert halves are dowled, register aligned and gasketed to prevent leakage. Only six bolts need be removed to disassemble the insert.



DOUBLE MECHANICAL SEALS must be recommended for gritty or abrasive applications. Seal faces are protected by clear water under pressure, injected directly into the seal cavity. The seal box design allows speedy seal maintenance.

AUTOMATIC GREASE SEALS utilize pump pressure to force grease into a stuffing box lantern ring, lubricating the packing and keeping out contaminants.

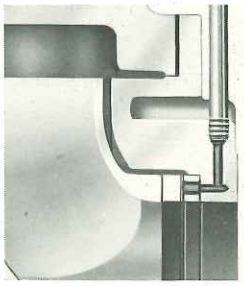


IMPELLER

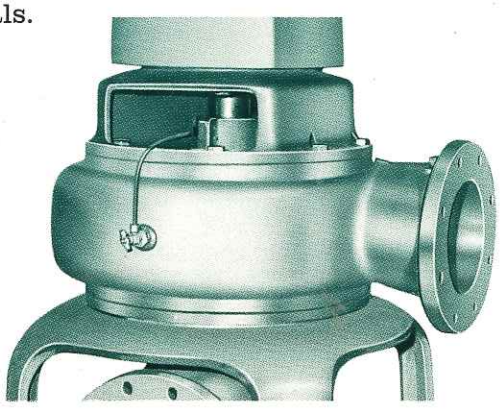
CASING

REPLACEABLE WEAR RINGS available individually or together, protect the impeller and / or casing from wear.

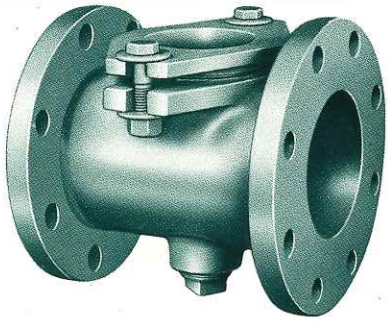
FLUSHING LINES to the wear ring faces wash away abrasives with clear liquid under pressure. Flushing lines can be used either with filters and valves from the pump casing or with the Aurora Water Seal unit for external liquid.



EXTERNAL PIPING with filters or valves to the stuffing box provide clear water flushing and cooling to the packing or seals.



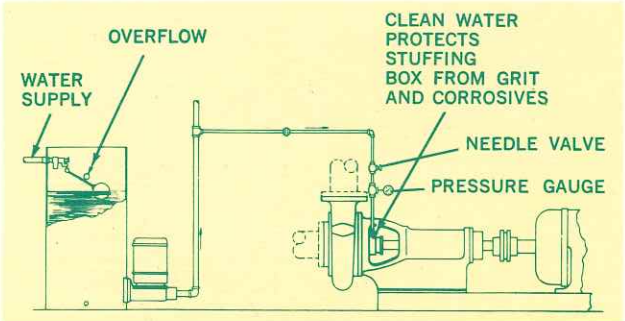
EQUIPMENT



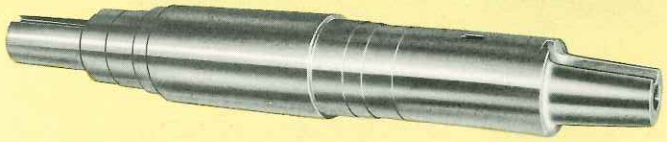
CLEAN OUT NOZZLES

NOZZLES for 611 series pumps have hand-size inspection openings to allow access to the impeller. Removing the nozzle allows the impeller and stuffing box to be removed without disturbing the suction and discharge piping or coupling alignment.

WATER SEAL UNITS are complete pumping systems used with, but independent of, larger industrial pumps. Their purpose is to pump clean water into the stuffing box or for wear ring flushing of pumps handling abrasive or corrosive materials. This provides clear water lubricating and flushing for mechanical seals, packing or wearing ring faces. For complete details, see Bulletin 690.

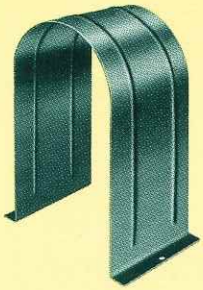


TYPICAL INSTALLATION OF AN AURORA WATER SEAL UNIT

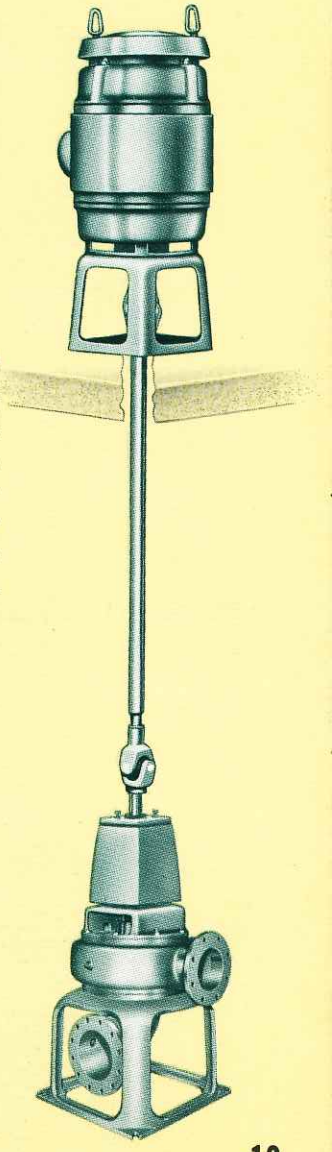


SHAFT AND SLEEVES are available in special alloys for difficult applications.

COUPLING GUARDS



CONSTANT LIQUID LEVEL SYSTEMS— refer to page 11 and Bulletin 720 for details.

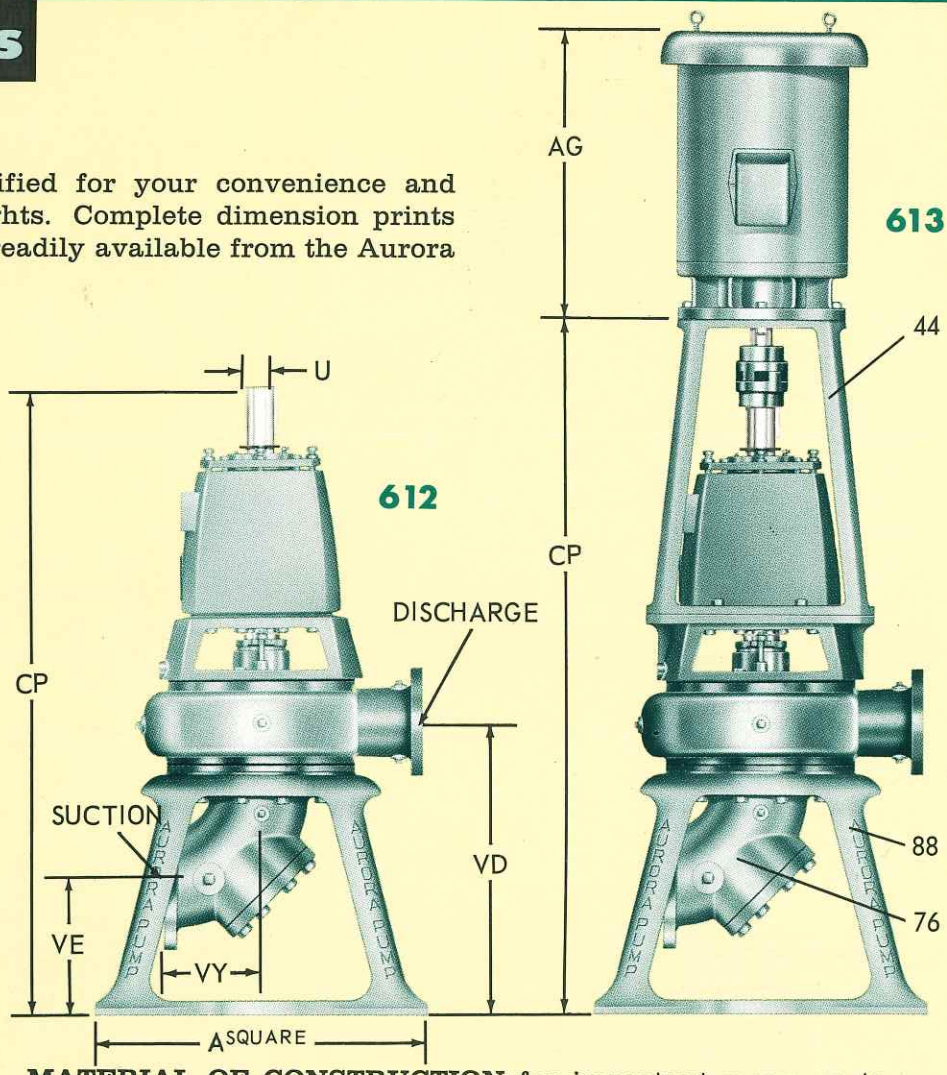


FLEXIBLE SHAFTING places expensive drivers in a remote location for added protection against flooding. Many combinations of drivers such as right angle gear drives, are available. Enclosed shafting is also available.

SPACER COUPLINGS are recommended for horizontal pump applications where it is desirable to remove the bearing assembly without disturbing the pump or motor.

CONSTRUCTION

DIMENSIONS SHOWN are simplified for your convenience and show overall dimensions and weights. Complete dimension prints tailored to your specific needs are readily available from the Aurora Pump factory.



DIMENSIONS – MOTOR							
MOTOR FRAME*	1750 RPM	HORSE POWER 1150 EPM	HORSE POWER 875 RPM	HORSE POWER 700 RPM	MOTOR WGT. IN LBS.	C	AG
184T	5	–	–	–	85	14	14
213T	7-1/2	–	–	–	150	16	18
215T	10	5	–	–	190	18	18
254T	15	7-1/2	–	–	230	21	21
256T	20	10	7-1/2	5	250	23	21
284T	25	15	10	7-1/2	350	24	24
286T	30	20	15	10	380	25	24
324T	40	25	20	15	475	26	26
326T	50	30	25	20	525	28	25
364T		40	30	25	630	29	27
364TS	60				630	27	27
365T		50	40	30	690	30	27
365TS	75				690	28	27
404T		60	50	40	830	33	32
404TS	100				830	30	32
405T		75	60	50	915	35	32
405TS	125				915	32	32
444T		100	75	60	1000	38	35
444TS	150				1000	34	35
445T	–	125	100	75	1100	40	35

* NOTE: Horizontal motors are "T" frame as shown
Vertical motors are "P" frame (Refer to catalog 610 for details)

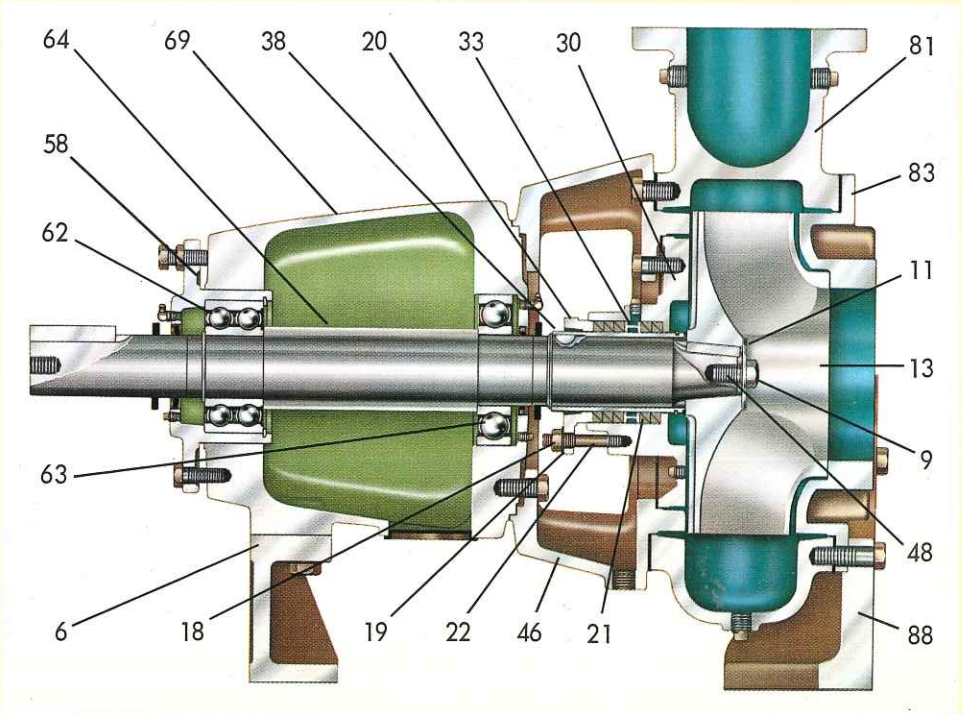
CONSTRUCTION			
PIECE NO.	DESCRIPTION	FITTED	MATERIAL OF CONSTRUCTION
6	Support	Iron	Cast Iron ASTM A48-56.
9	Locknut	Iron	Stainless Steel 18-8 ASTM A-167
11	Washer	Iron	Stainless Steel AISI 400
13	Impeller	Iron	Cast Iron ASTM A48-56
*16	Wear Ring (Impeller)	Iron	Stainless Steel AISI 316
18	Nut	Iron	Steel
		Stainless	Stainless Steel AISI 18-8
19	Clamp	Iron	Cadmium Plated Stl.
		Stainless	Stainless Steel AISI 18-8
20	Gland	Iron	Cast Iron ASTM A48-56
21	Packing	Iron	Graphited Asbestos
22	Stud	Iron	Steel
		Stainless	Stainless Steel AISI 18-8
30	Insert	Iron	Cast Iron ASTM A48-56
33	Lant. Ring	Iron	Cast Iron ASTM A48-56
		Stainless	Stainless Steel AISI 316
38	Sleeve (Pack)	Iron	Hard. Stn. Steel AISI 420
	Sleeve (Seal)	Iron	Bronze ASTM B62-4A
	Sleeve (Seal)	Stainless	Stainless Steel AISI 316
44	Head	Iron	Cast Iron ASTM A48-56
46	Adapter	Iron	Cast Iron ASTM A48-56
48	Stud	Iron	Stainless Steel AISI 18-8
58	Brg. Cap	Iron	Cast Iron ASTM A48-56
64	Shaft	Iron	Steel SAE 1045
62	Bearing	Iron	Steel
63	Bearing	Iron	Steel
69	Frame	Iron	Cast Iron ASTM A48-56
76	Elbow	Iron	Cast Iron ASTM A48-56
81	Casing	Iron	Cast Iron ASTM A48-56
83	Cover	Iron	Cast Iron ASTM A48-56
*85	Wear Ring (Cover)	Iron	Stainless Steel AISI 316
88	Support	Iron	Cast Iron ASTM A48-56

* Not Illustrated

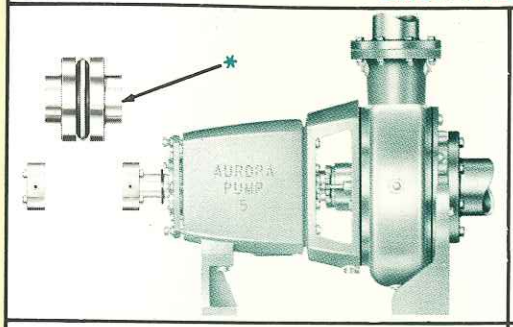
NOTES:

1. Dimensions and weights are approximate.
2. Refer to factory for base dimensions when spacer couplings are specified.
3. Not for construction purposes unless certified.
4. Frame sizes shown are for open dripproof motors only.
5. Conduit box is shown in approximate position. .Dimensions are not specified as they vary with each motor manufacturer.
6. Add pump, base and motor weight for unit weight.
7. Aurora Pump reserves the right to make revisions to this bulletin and related information without notice.

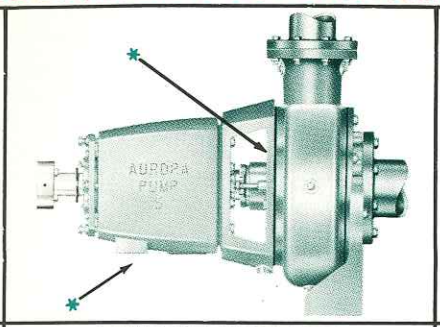
MATERIAL OF CONSTRUCTION for important pump parts are illustrated below. All iron pump construction is furnished unless otherwise specified. For complete details, refer to the Aurora Pump factory.



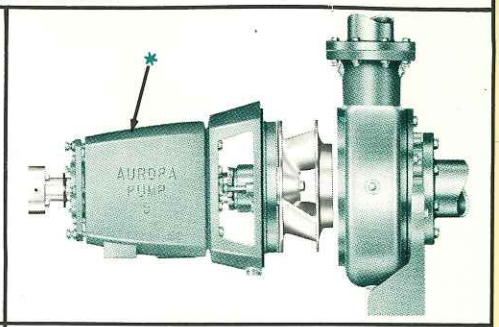
BACK PULL OUT DESIGN DOES NOT DISTURB PIPING



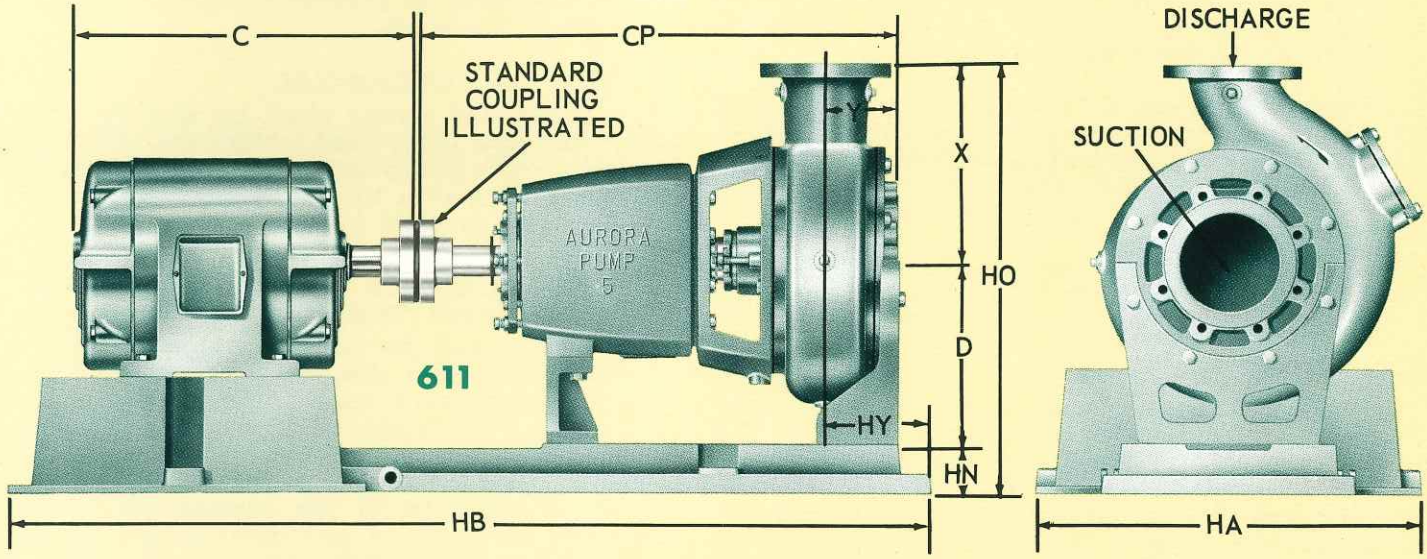
REMOVE SPACER COUPLING SLEEVE



REMOVE SUPPORT & ADAPTER BOLTS



REMOVE POWER FRAME ASSEMBLY



611 - 612 - 613 DIMENSIONS – PUMP																		611 - DIMENSIONS – BASE						
PUMP SIZE			POWER SERIES	PUMP WEIGHT			A	D	U	X	Y	CP			VD	VE	VY	MOTOR FRAMES	HA	HB	HN	HO	HY	BASE WGT
DISCH.	SUCT.	CASE BORE		611	612	613						611	612	613										
4	5	7	4	430	550	800	24	10	1-1/4	9	8	30	48	53	25	11	7	184T - 254T	16	52	3	22	9	120
																		256T & LARGER	20	58				170
4	5	10	4	470	590	840	24	11	1-1/4	11	8	30	48	53	25	10	8	182T - 254T	16	52	3	25	9	120
																		256T & LARGER	20	58				170
4	5	12	4	540	660	910	24	14	1-1/4	13	6	28	46	52	24	10	8	213T & LARGER	20	58	3	30	10	170
			5	940	1060	1310	24	14	2-3/8	13	6	40	58	63	24	10	8	215T - 286T	25	67	4	31	7	400
																		324TS & LARGER	32	76				450
4	5	15	5	1035	1285	1535	30	15	2-3/8	15	7	40	61	65	27	13	8	254T - 324T & 364TS	25	67	4	34	8	400
																		326T	32	76				450
6	6	12	5	1000	1250	1500	30	14	2-3/8	14	9	43	65	70	31	14	8	215T - 284T	25	67	4	32	7	400
																		286T & LARGER	32	76				450
6	8	15	5	1075	1325	1575	30	15	2-3/8	16	6	40	62	67	28	13	9	284T - 286T	25	67	4	35	8	400
																		324T - 444TS	32	76				450
																		1504	35	105				500
6	8	18	5	1135	1455	1755	30	18	2-3/8	18	7	40	63	68	29	13	9	284T - 286T	25	67	4	40	9	400
																		324T - 444TS	32	76				450
																		1504	35	105				500
8	8	15	5	1145	1465	1715	30	15	2-3/8	17	11	45	67	71	32	12	9	256T	25	67	4	36	9	400
																		284T & LARGER	32	76				450
8	10	18	5	1275	1595	1895	30	18	2-3/8	19	7	41	64	68	29	11	11	286T & LARGER	32	76	4	41	9	450
			6	1475	1795	2095	30	18	2-7/8	19	7	43	66	71	29	11	11	364T - 404T	32	76	4	41	12	450
																		405T & LARGER	35	105				500
8	10	22	5	1480	2150	2450	37	21	2-3/8	22	7	41	69	74	35	17	11	405U & LARGER	35	105	4	47	12	500
			6	1680	2350	2650	37	21	2-7/8	22	7	43	72	77	35	17	11	405T & LARGER	35	105	4	47	12	500
10	12	22	5	1610	2280	2580	37	21	2-3/8	23	7	42	70	75	35	16	12	404U & LARGER	35	105	4	48	13	500
			6	1810	2480	2780	37	21	2-7/8	23	7	44	73	77	35	16	12	364T & LARGER	35	105	4	48	13	500
12	14	22	5	1680	2350	2650	37	21	2-3/8	24	7	42	70	75	35	14	14	404U & LARGER	35	105	4	49	13	500
			6	1880	2550	2850	37	21	2-7/8	24	7	44	73	77	35	14	14	404T & LARGER	35	105	4	49	13	500

ENGINEERING SPECIFICATIONS

MODEL 611-612 AND 613

Furnish and install as shown on the plans, Aurora Model _____ (Horizontal-611) (Vertical-613 Flexible Coupled) (Vertical-612 Open Shaft) type Non-Clog Centrifugal pump. The pump shall be capable of delivering a capacity of _____ GPM when operating against a total dynamic head of ___ feet. The pump shall also deliver a maximum of _____ GPM when operating against a head of ___ feet. The minimum shut-off head acceptable will be ____ feet.

The pump shall operate at a maximum speed of ____ RPM. A unit operating at a lesser rotative speed will be considered, but in no event will a pump operating at more than the maximum speed specified be acceptable.

The pump casing shall be of the top centerline design and will be constructed of APCO-LOY 33″, and shall be of sufficient thickness to withstand stresses and strains at full operating pressures. Casings shall be subject to a hydrostatic pressure test of 125 lbs. A minimum size handhole 3″ x 5″ is to be provided in the casings for clean out purposes. The casing design shall allow front or rear impeller pullout.

The bearing housing is to be of cast iron and shall be furnished with a set of regreaseable bearings for both radial and thrust loads. The bearings shall have an average life of 100,000 hours and shall be mounted in a machined, moisture and dust proof housing. The housing is to have a register fit and then bolted to the pump casing to insure permanent alignment. An extra deep packing box is to be provided and must be so arranged with a lantern ring for either grease lubrication or tapped connections for water sealing from an outside source. A ¾″ drain opening must be provided to facilitate removal of lubricating liquid.

The impeller shall be of the enclosed type with wiper blades located on the back shroud to prevent accumulation of solids behind the impeller. The vanes shall be skewed to reduce noise. The impeller is to be of APCOLOY 33″ and shall be capable of passing a minimum sphere size of ____ inches. The impeller shall be dynamically balanced before assembly into the pump and shall be securely fastened to the shaft by means of a stainless steel key and impeller locknut. Axial adjustment of the impeller is to be external and a minimum clearance of ____ thousands should be maintained between the impeller and suction wearplate.

The pump shaft shall be constructed of high grade carbon steel having a tapered impeller extension and accurately machined. The minimum diameter acceptable will be ___ inches. The pump shaft shall be protected from wear by a corrosion and wear resisting hardened stainless steel shaft sleeve having a 450 minimum brinnel hardness. An "O" ring type gasket must be provided between the impeller hub and the shaft sleeve to prevent pumped liquid from corroding the shaft.

MODEL 611 HORIZONTAL

The pump and motor shall be mounted on a common base (cast iron) (structural steel) with drip rim. The pump and motor must be checked for alignment after the pump base has been installed and grouted in place.

MODEL 612 and 613 VERTICAL FLEXIBLE COUPLED AND VERTICAL OPEN SHAFT

The pump shall be supported by a cast iron pedestal base and shall be cast with a square footing to prevent legs being broken during shipment. The pedestal shall have openings large enough to permit access to the suction line. A hand hole equal to the suction opening must be provided in the suction elbow. The pedestal must be of sufficient height so that the suction elbow will not touch the floor or foundation upon which it stands.

Vertical flexible coupled pumps shall be furnished with a cast iron motor bracket which is to be bolted to a separate pump adapter. The motor bracket must be machined with a register fit to insure proper alignment of motor shaft and pump shaft.

Vertical open shaft pumps are to be driven through flexible shafting with ___ dia. tubing, and intermediate bearings. Shafting must be of sufficient size to transmit required horsepower and must be provided with a slip spline which will permit removal of the pump rotating assembly without removing any section of intermediate shafting, bearings, suction or discharge piping.

AURORA® PUMPS

AURORA PUMP — AURORA, ILL. 60507
A UNIT OF GENERAL SIGNAL CORPORATION
FACTORY BRANCH SALES OFFICES: LITHONIA (ATLANTA), GEORGIA
AURORA (CHICAGO), ILLINOIS HACKENSACK, NEW JERSEY
CLEVELAND, OHIO DALLAS, TEXAS MILWAUKEE, WISCONSIN
CANADIAN PLANT: REXDALE (TORONTO), ONTARIO
Local Distributor is listed in the yellow pages of your phone book.
Export Department: Aurora, Illinois Cable Address "NYABINT"
The Trade-mark AURORA is registered in U.S. Patent Office.
Copyright 1968, Aurora Pump, A Unit of General Signal Corporation.
Designed and Produced by Whitaker Guernsey Studio, Chicago, Ill.
5,000 6-68